C. VERTICAL AND HORIZONTAL CONTROL

Refer to the Horizontal and Vertical Control Report for a detailed description of the horizontal and vertical control used during this survey. A summary of horizontal and vertical control used for the survey follows.

C.1 VERTICAL CONTROL

The initial vertical control for the survey was based on the Mean Lower Low Water (MLLW) tidal datum from the National Water Level Observation Network (NWLON) station at Sand Point (9459450). Final vertical control for the survey was based on the MLLW tidal datum from the tide station, Chirikof Island SW Anchorage (9458293), established by John Oswald & Associates, LLC (JOA).

The vertical control for the survey was based on the MLLW tidal datum. During field operations tide data for the NWLON station at Sand Point was downloaded from the CO-OPS website and these preliminary tide values were used to reduce depth soundings.

The final tidal levels for Chirikof Island were computed by JOA from observed tide at Chirikof Island SW Anchorage.

Station details are as follows:

		WGS84	
Gauge	**Location**	**Latitude**	**Longitude**
9459450	City Dock - Sand Point, AK	55° 20.2' N	160° 30.1' W
9458293	Chirikof Island - SW Anchorage	55° 48' 54" N	155° 44' 35" W

C.2 ZONING

For the preliminary reduction of soundings, tide zones that cover the extent of the survey area were supplied by NOAA. Each of these tide areas use time and range correctors relative to the Sand Point tide station. These are as follows:

Tide Zone	GS Identifier	Time Corrector	Range Corrector	Reference Station
SWA148	TA1	-18 minutes	x1.21	9459450
SWA149	TA2	-18 minutes	x1.25	9459450
SWA150	TA3	-18 minutes	x1.29	9459450

The final tide zone that covers the extent of the survey area was supplied by JOA. The Tide Station Report, supplied by JOA, detailing the tide zone, can be found in Appendix I of the Horizontal and Vertical Control Report. A .pdf copy is also available in the Tidal Data section of the USB drive. No time or range correctors were applied to the verified tide from

the Chirikof Island SW Anchorage (9458293) tide gauge as one tide zone covered the extent of the survey area.

The derived value for the difference between MLLW and MHW at the Chirikof Island SW Anchorage subordinate tide gauge is 2.40m. From the final zoning, a range factor of 1.00 was applicable for Sheet B, resulting in a MHW value of 2.40m.

C.3 HORIZONTAL CONTROL

Data collection and processing were conducted on the AS and GS in World Geodetic System (WGS84) on Universal Transverse Mercator (Northern Hemisphere) projection UTM (N) in Zone 5, Central Meridian 153° W. This data was post-processed and all soundings are positioned relative to the North American Datum 1983 (NAD83). All units are in meters.

C.3.1 LADS Local GPS Base Station – Kodiak

Real-time positions were determined using an Ashtech GG24 GPS receiver on the aircraft, operating in autonomous GPS mode. A local GPS base station was established by JOA on the roof of the Tenix LADS office building in Kodiak, AK on May 9, 2006, in order to post-process KGPS positions following survey flights.

The derived NAD83 coordinates for the local GPS base station are:

NAD83		**UTM (N) Zone 5**		
Latitude (N)	**Longitude (W)**	**Easting (m)**	**Northing (m)**	**Ellipsoidal Height (m)**
57° 47' 19.2830"	152° 24' 22.1333"	535 308.385	6 405 339.545	28.354

Post-processed KGPS positions were determined offline using data logged at the local GPS base station and on the aircraft. This data was processed with Ashtech PNAV software to calculate both a DGPS and KGPS position solution for the survey flights. The post-processed KGPS positions were imported into the GS and applied to all soundings. This provided increased sounding position accuracy from the real-time autonomous GPS.